Remarks:

Reconsideration of the application is requested.

Claims 1-5, 7-27, and 29-34 are now in the application. Claims 1, 7, 13, 15, 16, 17, 19, 20, 25, and 29 have been amended, claims 6 and 28 have been cancelled, and claims 30-34 have been added.

In item 2 on page 2 of the above-identified Office action, claims 1-17 have been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

In regard to claims 1 and 17, the Examiner stated that it is not known what is meant by the term "behind". Further in regard to claim 1, the Examiner stated that the inclined surfaces are adjacent to each other.

Claim 1 has been amended to recite, "said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent said inclined end surface of said second optical waveguide section". Support for the change can be found by referring to Fig. 3a, for example.

Claim 2 has been amended to recite, "said plurality of said optical components being sequentially located". Support for the change can be found by referring to Fig. 4a, for example.

It is accordingly believed that the claims meet the requirements of 35 U.S.C. § 112, second paragraph. Should the Examiner find any further objectionable items, counsel would appreciate a telephone call during which the matter may be resolved. The above noted changes to the claims are provided solely for the purpose of satisfying the requirements of 35 U.S.C. § 112. The changes are neither provided for overcoming the prior art nor do they narrow the scope of the claims for any reason related to the statutory requirements for a patent.

In item 4 on page 2 of the Office action, claims 1-5, 17, 19, 27, and 28 have been rejected as being anticipated by Henderson et al. (4,456,329) under 35 U.S.C. § 102. Applicants respectfully traverse with regard to claim 17.

Claim 17 defines an electro-optical module that includes, inter alia:

a plurality of optical components (each one being either a detecting component or a transmitting component) that are sequentially located; and

each one of said plurality of said optical components is associated with an inclined surface selected from the group

consisting of said inclined surfaces of said plurality of said waveguide sections.

Henderson et al. merely disclose optically transparent members 12, 12a, and therefore claim 17 is believed to be patentable.

In items 5-9 of the Office action, various claims have been rejected over various combinations of prior art under 35 U.S.C. § 103. Please see the discussion below.

In item 10 on page 8 of the Office action, claims 6-16, 20-23, 25, and 29 have been rejected as being dependent upon a rejected base claim. However, the Examiner indicated that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The indication of allowability is greatly appreciated, and the claims have been amended in response to the indication of allowability. Claim 1 has been amended to include all of the limitations of claim 6, while claims 15, 20, 25, and 29 have been amended to be in independent form.

Support for the change to claim 1 with regard to the "detecting element for detecting and receiving light" is believed to be inherent with the claim as originally

presented. Additional support can be found by referring to the application at page 17, line 25, and at page 26, line 6, for example. Similar changes have been made throughout the claims.

Support form the change to claim 19 can be found, for example, by referring to Figs. 8-10 and 4d of the application. Additional support can be found by referring to the application at page 4, line 25 through page 5, line 14, and at page 10, line 4-11.

Support for added claim 30 can be found by referring to claims 1, 17, and 19, as originally presented, and to Figs. 8-10 and 4d of the application, which show that the axis of the optical components are perpendicular to the axis of the associated optical waveguide section.

Support for added claims 31-34 can be found by referring to claims 1, 15, 25, and 29, as amended. Claims 31-34 are directed towards an optical waveguide structure that does not necessarily include an optical component such as a detector or a transmitter, but which of course can be used with such an optical detector.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of any of the independent claims.

Therefore, the independent claims and the dependent claims are believed to be patentable.

In view of the foregoing, reconsideration and allowance of claims 1-5, 7-27, and 29-34 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, he is respectfully requested to telephone counsel so that, if possible, patentable language can be worked out.

There are now ten independent claims in the application, and the amount of $588 has been included herewith to cover the fee required for presenting seven claims in excess of three.

In addition, there are now a total of 32 claims in the application. At the time of filing, payment was made for twenty-nine claims. The amount of $54.00 has also been included herewith to cover the fee required for presenting three more claims in excess of twenty. The total amount enclosed is $642.00 (588+54).

Please charge any other fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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IT-273

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Lutz Melchior et al.

Applic. No. : 09/894,675

Filed : June 28, 2001

Title : Electro-Optical Module for Transmitting and/or Receiving Optical Signals on at Least Two Optical Data Channels

Examiner : Kevin S. Wood

Group Art Unit : 2874

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 1 (amended). An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis; [and]

at least one optical component, said optical component selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a [receiving] detecting component that receives and detects light output from said optical waveguide;

a first glass ferrule; and

a second glass ferrule;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and [behind] adjacent said inclined end surface of said second optical waveguide section;

said inclined end surface [of] said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

said first glass ferrule receiving said first optical waveguide section and having an end surface that is inclined to correspond to said inclined end surface of said first optical waveguide section, said first glass ferrule being transparent for the light of the plurality of the optical channels; and

said second glass ferrule receiving said second optical waveguide section and having an end surface that is inclined to correspond to said inclined end surface of said second optical waveguide section, said second glass ferrule being transparent for the light of the plurality of the optical channels.

Claim 7 (amended). The module according to [claim 6] claim 1, comprising:

a mounting tube [that receives] receiving said first glass ferrule, said first optical waveguide section, said second glass ferrule, and said second optical waveguide section;

[and]

said mounting tube axially positioning [that and axially positions] said first glass ferrule with respect to said second glass ferrule.

Claim 13 (amended). The module according to claim 7, comprising:

a holder;

said mounting tube [40] formed with a fixing structure for fixing said mounting tube on said holder.

Claim 15 (amended). An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis;

at least one optical component, said optical component selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide; and

immersion means;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent said inclined end surface of said second optical waveguide section;

said inclined end surface of said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

[The module according to claim 1, comprising:

immersion means;]

said first optical waveguide section and said second optical waveguide section defining a gap therebetween;

said immersion means filling said gap and having a matched refractive index.

Claim 16 (amended). The module according to claim 15, wherein said mounting tube [40] is formed with a radial opening for insertion of an immersion means, said radial opening formed adjacent said first optical waveguide section and said second optical waveguide section.

Claim 17 (amended). The module according to claim 1, comprising:

a plurality of waveguide sections having inclined surfaces, plurality of said waveguide sections including said at waveguide sections;

said at least one optical component including a plurality of optical components that are each selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a [receiving] detecting component that receives and detects light output from said optical waveguide;

said plurality of said optical components being sequentially located [one behind another];

each one of said plurality of said optical components being associated with an inclined surface selected from the group consisting of said inclined surfaces of said plurality of said waveguide sections.

Claim 19 (amended). The module according to claim 1, wherein said second optical waveguide section has an optical axis and said optical component has an optical axis that runs esentially [parallel] perpendicular to the optical axis of said second optical waveguide section.

Claim 20 (amended). An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis;

at least one optical component, said optical component selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide; and

a TO-can holding said optical component;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent said inclined end surface of said second optical waveguide section;

said inclined end surface of said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide

[The module according to claim 1 comprising a TO-can holding said optical component].

Claim 25 (amended). An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis; and

at least one optical component, said optical component selected from the group consisting of a transmitting component providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent said inclined end surface of said second optical waveguide section;

said inclined end surface of said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface

of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

[The module according to claim 1, wherein:]

said second optical waveguide section [has] having a core;

said first optical waveguide section [is] being adjacent said second optical waveguide section and [has] having a core [in] that is larger than said core of said second waveguide section.

Claim 29 (amended). An electro-optical module for transmitting and/or receiving light of a plurality of optical data channels, comprising:

an optical waveguide for carrying light of a plurality of optical data channels, said optical waveguide having an optical axis; and

at least one optical component, said optical component selected from the group consisting of a transmitting component

providing light that is injected into said optical waveguide, and a detecting component that receives and detects light output from said optical waveguide;

said optical waveguide forming at least two optical waveguide sections;

said at least two optical waveguide sections including a first optical waveguide section having an inclined end surface and a second optical waveguide section having an inclined end surface;

said inclined end surface of said first optical waveguide section being positioned along the optical axis and adjacent said inclined end surface of said second optical waveguide section;

said inclined end surface of said second optical waveguide section configured to perform a function selected from the group consisting of:

injecting light for one of said plurality of said optical data channels into said optical waveguide when the injected light is provided to said inclined end surface of said second optical waveguide section at an angle relative to the optical axis of said waveguide, and

outputting light of one of said plurality of said optical data channels from said optical waveguide at an angle relative to the optical axis of said waveguide;

said inclined surface of said first waveguide section and said inclined end surface of said second waveguide section being adjacent and forming a beam splitter;

[The module according to claim 28, wherein] said beam splitter [is] being a 50/50 beam splitter.